

STUDIES IN THE EUPATORIEAE (COMPOSITAE). XVIII.

NEW COMBINATIONS IN FLEISCHMANNIA

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In this article we are setting forth a new and natural concept for the old and much misused generic name, Fleischmannia. This is part of a revisionary effort that began in our study of the Hofmeisteria complex (King & Robinson, 1966). The initial stage of the revision of Fleischmannia, the removal of alien species, has continued to the point where only one species, F. arguta, remains in the genus. A second stage, represented in this paper, is the recharacterization of Fleischmannia and the inclusion of all species that we recognize as related to F. arguta.

The previous unnatural concepts of Fleischmannia have all emphasized the five setae of the pappus, a character not found in any other species we presently recognize in the genus. The relationships given here are not entirely new concepts, however. In the original description of Eupatorium trinervium Schultz-Bip. (Seemann, 1856) there was the comment "Obs. Eupatorio arguto H.B.K. . . . affinis esse videtur". A more critical understanding is shown in the remarks of B.L. Robinson (1926) in his description of Eupatorium rivulorum. "This species in habit, habitat, foliage, and in some details of pubescence recalls Fleischmannia arguta (H.B.K.) Robinson, . . . The species, if referred to Fleischmannia would by its indefinite (though not very numerous) pappus-bristles, break down the slight distinction between that genus and Eupatorium. If, on the other hand it is referred to Eupatorium (from which on technical grounds it cannot be readily separated) its close similarity to Fleischmannia must render the further separation of that genus rather artificial. Neither disposition is entirely satisfactory".

As characterized here, the genus Fleischmannia is a natural entity clearly distinct from all other genera in the Eupatorieae. Closest relationship may be to the small genus Conoclinium of the United States and northern Mexico, but that genus shows numerous glands on the corolla and achene, a rather indistinct carpodium, and blunt-tipped cells at the apices of the pappus setae. There has been considerable confusion between species of Fleischmannia and the superficially similar species variously treated as Kyrstenia or Ageratina, but as will be shown in the treatment of the latter group, no really close relationship is involved.

Chromosome counts of species occur in many publications, but the most significant study is that of Baker (1967).

Fleischmannia Schultz-Bip., Flora 33: 417. 1850.

Sparingly branched herbs; leaves opposite, rarely subopposite or alternate, elliptical to rhomboidal usually with cuneate short-petiolate base, upper margin serrate or crenulate, in one species leaves dissected into long narrow segments. Inflorescence laxly branching; heads 30-50 flowered; involucre of ca. 30 narrow, usually acute, subimbricate, mostly subequal phyllaries in 2-3 series; receptacle glabrous or with minute scattered hairs. Corolla tubular with only slightly narrowed base; outer surface of lobes usually with short hairs, with glands in some Mexican and central American species, surface papillose with projecting cells ends especially along margins of lobes, stomates absent; cells of much of inner surface of lobes and tube with upper ends projecting as papillae, cells of tube mostly narrow with sinuous walls. Anther collar usually slender, with elongate cells showing distinct transverse thickenings throughout, with few or indistinct short cells below; exothelial cells mostly quadrate or wider than long; anther appendage large, often truncate at apex. Style without distinct basal node; surface cells of stylar appendage densely long projecting. Achene prismatic, usually with setae or serrations on ribs, without glands; carpopodium distinct with prominent upper rim, rounded with thick walled usually quadrate cells; pappus of 5-40 slender sometimes fragile setae, with pointed apical cells. Embryo not noticeably sclerotized at lower end. Chromosome numbers $n = 4$, $n = 10$.

Type species: Fleischmannia rhodostylis Schultz-Bip. = F. arguta (H.B.K.) B.L.Robinson.

Our studies indicate that the genus contains the following fifty three species.

Fleischmannia aequinoctialis (B.L.Robinson) R.M.King & H.Robinson, comb. nov. Eupatorium aequinoctiale B.L.Robinson, Contr. Gray Herb. n.s. 61: 4. 1920. Ecuador.

Fleischmannia anisopoda (B.L.Robinson) R.M.King & H.Robinson, comb. nov. Eupatorium anisopodum B.L.Robinson, Proc. Amer. Acad. 36: 477. 1901. Guatemala.

Fleischmannia arguta (H.B.K.) B.L.Robinson, Proc. Amer. Acad. 42: 35. 1906. Eupatorium argutum H.B.K., Nov. Gen. et Sp. 4: 121. ed. fol. 1818. Mexico.

Fleischmannia bergantinensis (Badillo) R.M.King & H.Robinson, comb. nov. Eupatorium bergantinense Badillo, Bot. Soc. Venez. Cienc. Nat. 10: 294. 1946. Venezuela.

Fleischmannia blakei (B.L.Robinson) R.M.King & H.Robinson, comb. nov. Eupatorium blakei B.L.Robinson, Contr. Gray Herb. n.s. 61: 5. 1920. Honduras.

- Fleischmannia bridgesii (B.L.Robinson) R.M.King & H.Robinson, comb. nov. Eupatorium bridgesii B.L.Robinson, Proc. Amer. Acad. 55: 7. 1919. Bolivia.
- Fleischmannia carletonii (B.L.Robinson) R.M.King & H.Robinson, comb. nov. Eupatorium carletonii B.L.Robinson, Contr. Gray Herb. n.s. 73: 7. 1924. Honduras.
- Fleischmannia cookii (B.L.Robinson) R.M.King & H.Robinson, comb. nov. Eupatorium cookii B.L.Robinson, Proc. Amer. Acad. 55: 9. 1919. Peru.
- Fleischmannia crocodilia (Standley & Steyermark) R.M.King & H.Robinson, comb. nov. Eupatorium crocodilium Standley & Steyermark, Field Mus. Publ., Bot. 23: 182. 1944. Guatemala.
- Fleischmannia dissolvens (Baker) R.M.King & H.Robinson, comb. nov. Eupatorium dissolvens Baker in Martius, Flora Brasil. 6(2): 308. 1876. Brasil.
- Fleischmannia fragilis (B.L.Robinson) R.M.King & H.Robinson, comb. nov. Eupatorium fragile B.L.Robinson, Contr. Gray Herb. n.s. 100: 13. 1932. Peru.
- Fleischmannia gonzalezii (B.L.Robinson) R.M.King & H.Robinson, comb. nov. Eupatorium gonzalezii B.L.Robinson, Proc. Amer. Acad. 36: 479. 1901. Mexico.
- Fleischmannia holwayana (B.L.Robinson) R.M.King & H.Robinson, comb. nov. Eupatorium holwayanum B.L.Robinson, Proc. Amer. Acad. 42: 40. 1906. Mexico.
- Fleischmannia huigrensis (B.L.Robinson) R.M.King & H.Robinson, comb. nov. Eupatorium huigrense B.L.Robinson, Contr. Gray Herb. n.s. 61: 7. 1920. Ecuador.
- Fleischmannia hymenophylla (Klatt) R.M.King & H.Robinson, comb. nov. Eupatorium hymenophyllum Klatt in Durand & Pittier, Bull. Soc. Bot. Belg. 31: 190. 1892 (1893). Costa Rica.
- Fleischmannia imitans (B.L.Robinson) R.M.King & H.Robinson, comb. nov. Eupatorium imitans B.L.Robinson, Contr. Gray Herb. n.s. 68: 20. 1923. El Salvador.
- Fleischmannia incarnata (Walter) R.M.King & H.Robinson, comb. nov. Eupatorium incarnatum Walter, Flora Carolin. 200. 1788. United States, Mexico.
- Fleischmannia jejuna (Standley & Steyermark) R.M.King & H.Robinson, comb. nov. Eupatorium jejunum Standley &

Steyermark, Field Mus. Publ., Bot. 23: 183. 1944. Guatemala.

Fleischmannia klattiana (Hieron.) R.M.King & H.Robinson, comb. nov. Eupatorium klattianum Hieron., Engl. Bot. Jahrb. 28: 573. 1901. Colombia.

Fleischmannia laxicephala (Cabrera) R.M.King & H.Robinson, comb. nov. Eupatorium laxicephalum Cabrera, Sellowia 15: 196. 1963. Brasil.

Fleischmannia laxa (Gardner) R.M.King & H.Robinson, comb. nov. Eupatorium laxum Gardner, Hook. Lond. Journ. Bot. 5: 476. 1846. Brasil.

Fleischmannia lithophila (B.L.Robinson) R.M.King & H.Robinson, comb. nov. Eupatorium lithophilum B.L.Robinson, Contr. Gray Herb. n.s. 73: 14. 1924. Peru.

Fleischmannia lloensis (Hieron.) R.M.King & H.Robinson, comb. nov. Eupatorium lloense Hieron. in Sodiro, Engl. Bot. Jahrb. 29: 11. 1901. Ecuador.

Fleischmannia magdalenensis (B.L.Robinson) R.M.King & H.Robinson, comb. nov. Eupatorium magdalenensis B.L.Robinson, Proc. Amer. Acad. 54: 250. 1918. Colombia.

Fleischmannia marginata (Poepp. & Endl.) R.M.King & H.Robinson, comb. nov. Eupatorium marginatum Poepp. & Endl., Nov. Gen. ac Sp. Plant. 3: 54. 1845. Peru.

Fleischmannia mayorii (B.L.Robinson) R.M.King & H.Robinson, comb. nov. Eupatorium mayorii B.L.Robinson, Contr. Gray Herb. n.s. 68: 24. 1923. Colombia.

Fleischmannia mercedensis (B.L.Robinson) R.M.King & H.Robinson, comb. nov. Eupatorium mercedense B.L.Robinson, Contr. Gray Herb. n.s. 104: 19. 1934. Peru.

Fleischmannia microstemon (Cassini) R.M.King & H.Robinson, comb. nov. Eupatorium microstemon Cassini, Dict. Sci. Nat. 25: 432. 1822. Mexico, C.Amer., W.Ind., S.Amer.

Fleischmannia misera (B.L.Robinson) R.M.King & H.Robinson, comb. nov. Eupatorium miserum B.L.Robinson, Proc. Amer. Acad. 54: 258. 1918. Colombia.

Fleischmannia multinervis (Benth.) R.M.King & H.Robinson, comb. nov. Eupatorium multinerve Benth., Plant. Hartweg. 76. 1841. C.Amer.

- Fleischmannia obscurifolia (Hieron.) R.M.King & H.Robinson, comb. nov. Eupatorium obscurifolium Hieron. in Sodiro, Engl. Bot. Jahrb. 29: 9. 1900. Ecuador.
- Fleischmannia pennellii (B.L.Robinson) R.M.King & H.Robinson, comb. nov. Eupatorium pennellii B.L.Robinson, Proc. Amer. Acad. 54: 254. 1918. Colombia.
- Fleischmannia plectranthifolia (Benth. ex Oerst.) R.M.King & H.Robinson, comb. nov. Eupatorium plectranthifolium Benth. ex Oerst., Kjoeb. Vidensk. Meddel. 76. 1852. Costa Rica.
- Fleischmannia polopolensis (B.L.Robinson) R.M.King & H.Robinson, comb. nov. Eupatorium polopolense B.L.Robinson, Contr. Gray Herb. n.s. 61: 10. 1920. Bolivia.
- Fleischmannia porphyranthema (A.Gray) R.M.King & H.Robinson, comb. nov. Eupatorium porphyranthemum A.Gray, Proc. Amer. Acad. 15: 27. 1880. Mexico.
- Fleischmannia prasiifolia (Griseb.) R.M.King & H.Robinson, comb. nov. Eupatorium prasiifolium Griseb., Abh. Kön. Ges. Wiss. Gött. 19: 167. 1874. Argentina, Paraguay, Brasil.
- Fleischmannia pratensis (Klatt) R.M.King & H.Robinson, comb. nov. Eupatorium pratense Klatt, Bull. Soc. Bot. Belg. 31: 193. 1892 (1893). Costa Rica.
- Fleischmannia pycnocephaloides (B.L.Robinson) R.M.King & H.Robinson, comb. nov. Eupatorium pycnocephaloides B.L.Robinson, Proc. Amer. Acad. 51: 534. 1916. Guatemala.
- Fleischmannia pycnocephala (Lessing) R.M.King & H.Robinson, comb. nov. Eupatorium pycnocephalum Lessing, Linnaea 6: 404. 1831. N.Amer.-S.Amer.
- Fleischmannia remotifolia (A.P.Decandolle) R.M.King & H.Robinson, comb. nov. Eupatorium remotifolium A.P.Decandolle, Prodr. 5: 165. 1836. Brasil.
- Fleischmannia rhodotephra (B.L.Robinson) R.M.King & H.Robinson, comb. nov. Eupatorium rhodotephrum B.L.Robinson, Contr. Gray Herb. n.s. 77: 32. 1926. Peru.
- Fleischmannia rivulora (B.L.Robinson) R.M.King & H.Robinson, comb. nov. Eupatorium rivulorum B.L.Robinson, Contr. Gray Herb. n.s. 77: 34. 1926. Mexico.
- Fleischmannia schickendantzii (Hieron.) R.M.King & H.Robinson, comb. nov. Eupatorium schickendantzii Hieron., Engl. Bot. Jahrb. 22: 769. 1897. Argentina.

- Fleischmannia seleriana (B.L.Robinson) R.M.King & H.Robinson, comb. nov. Eupatorium selerianum B.L.Robinson, Proc. Amer. Acad. 35: 340. 1900. Mexico.
- Fleischmannia sideritides (Benth. ex Oerst.) R.M.King & H.Robinson, comb. nov. Eupatorium sideritides Benth. ex Oerst., Kjoeb. Vidensk. Meddell. 77. 1852. Costa Rica.
- Fleischmannia sinaloensis (B.L.Robinson) R.M.King & H.Robinson, comb. nov. Eupatorium sinaloense B.L.Robinson, Contr. Gray Herb. n.s. 77: 39. 1926. Mexico.
- Fleischmannia sinclairii (Benth. ex Oerst.) R.M.King & H.Robinson, comb. nov. Eupatorium sinclairii Benth. ex Oerst., Kjoeb. Vidensk. Meddel. 79. 1852. C.Amer.
- Fleischmannia soratae (Schultz-Bip. ex B.L.Robinson) R.M.King & H.Robinson, comb. nov. Eupatorium soratae Schultz-Bip. ex B.L.Robinson, Contr. Gray Herb. n.s. 61: 51. 1920. Bolivia.
- Fleischmannia tamboensis (Hieron.) R.M.King & H.Robinson, comb. nov. Eupatorium tamboense Hieron., Engl. Bot. Jahrb. 22: 770. 1897. Bolivia.
- Fleischmannia trinervia (Schultz-Bip.) R.M.King & H.Robinson, comb. nov. Eupatorium trinervium Schultz-Bip. in Seemann, Bot. Voy. Herald 300. 1856. Mexico.
- Fleischmannia valeriana (Standley) R.M.King & H.Robinson, comb. nov. Eupatorium valerianum Standley, Field Mus. Publ., Bot. 18: 1474. 1938. Costa Rica.
- Fleischmannia viscidipes (B.L.Robinson) R.M.King & H.Robinson, comb. nov. Eupatorium viscidipes B.L.Robinson, Proc. Amer. Acad. 36: 484. 1901. C.Amer.
- Fleischmannia yungasensis (B.L.Robinson) R.M.King & H.Robinson, comb. nov. Eupatorium yungasense B.L.Robinson, Contr. Gray Herb. n.s. 104: 30. 1934. Bolivia.

Excluded species

- Fleischmannia repens B.L.Robinson = Ageratina.
F. schaffneri A.Gray = Hofmeisteria.
F. standleyi Blake = Hofmeisteria.
F. urenifolia (Hook. & Arn.) Benth. & Hook.f. = Hofmeisteria.

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